

# Real-Time Novel Holographic Monitoring of Airborne Trace Contaminants Onboard Space Vessels, Phase I

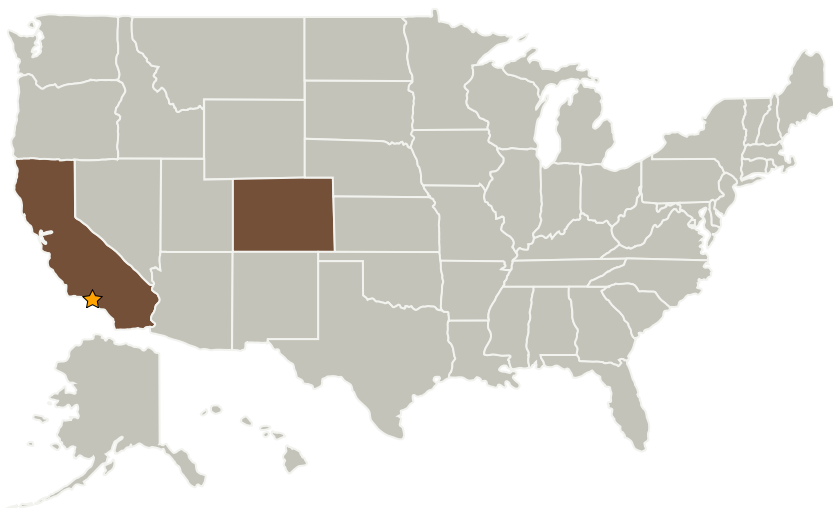
Completed Technology Project (2005 - 2005)



## Project Introduction

New challenges and mission requirements constantly emerge, establishing the need for versatile equipment and instruments to perform the new/expanded tasks. AlphaSniffer propose the development of a compact chemical monitoring system that provides highly sensitive, selective, and rapid detection of trace contaminants that will be able to meet such new requirements. The monitoring system will have low power consumption and remain stable and reliable for 12 months or longer. The system is based on unique technology of detecting a chemical reaction/interaction of the sought-after chemical in a (polymeric) transducer material through real-time dynamic optical holography. Significant advantages over other competing sensor technologies include: fast response and recovery times (sub second), low ppb sensitivity, low power and compact size. Additionally transducer elements may easily be replaced if they are damaged/contaminated. The implementation of a single optical contact between the polymeric transducer element and the holographic detection system minimizes complications of replacing the sensing agents/transducers. Due to the rapid response, the transducer elements are only briefly exposed to the reacting/interacting chemical, drastically improving long-term stability and repeatability. When completed, this research should lead to the development of a compact state-of-the-art trace chemical monitoring system, with superior versatility and performance over other sensors.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work    | Role                    | Type        | Location             |
|----------------------------------|-------------------------|-------------|----------------------|
| ★ Jet Propulsion Laboratory(JPL) | Lead Organization       | NASA Center | Pasadena, California |
| AlphaSniffer LLC                 | Supporting Organization | Industry    | Boulder, Colorado    |

| Primary U.S. Work Locations |          |
|-----------------------------|----------|
| California                  | Colorado |

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

Oyvind Nilsen

## Technology Areas

### Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - └ TX11.6 Ground Computing
    - └ TX11.6.2 Automated Exascale Software Development Toolset